

## NEW SPECIES AND NEW SUBGENUS OF *BOMBYLIUS* (DIPTERA: BOMBYLIIDAE)<sup>1</sup>

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**ABSTRACT:** Two new species, *Bombylius curtirhynchus* and *B. painteri*, and two new subspecies, *Bombylius albicapillus washingtoniensis* and *B. lancifer xanthothrix*, are described and illustrated. In addition, a new subgenus, *Bombylius (Zephyrectes)* is described to include *Bombylius anthophoroides* Evenhuis and *B. montanus* Johnson and Johnson.

**DESCRIPTORS:** Diptera; Bombyliidae; *Bombylius curtirhynchus*, n. sp.; *Bombylius painteri*, n. sp.; *Bombylius albicapillus washingtoniensis*, n. ssp.; *Bombylius lancifer xanthothrix*, n. ssp.; *Bombylius (Zephyrectes)*, n. subg.; *Bombylius (Zephyrectes) anthophoroides* Evenhuis, n. comb.; *Bombylius (Zephyrectes) montanus* Johnson and Johnson, n. comb.

Upon examination of numerous specimens of *Bombylius anthophoroides* Evenhuis and *B. montanus* Johnson and Johnson and comparing them with other species of *Bombylius*, it was found that these two represent a separate group of species with shared characters that warrant at least subgeneric, if not generic, status. A description of the new subgenus follows below. Also, at this time, I have taken the opportunity to describe two species and two subspecies of *Bombylius* new to science. These descriptions are presented here to facilitate forthcoming publications of western U.S. Bombyliidae.

### *Zephyrectes*, new subgenus

**Male.** Length 10mm. Frons grey to brown, predominantly white pilose, some black hair may be present; genae, face, and oral margin light tan, white pilose; argentous tufts of recumbent pile lateral to antennal bases; gula white to grey, white pilose; occiput grey to tan, white pilose; antennal segments black, white hair and scales on segments I and II, segment III bare. Scutum and scutellum grey-brown, pale yellow pilose; pleura grey, white pilose; halter yellow. Legs orange, white hair and scales basally on coxae and femora. Wing tinted brown basally, rest of wing hyaline; squama grey to brown, fringe white. Abdomen grey-brown, white pile on basal tergites becoming denser on segments IV-VII; sternites brown, white pilose; black hair on posterior margin of apical sternites. Genitalia (Fig. 1) with basistylus three times as long as wide in lateral view, tapering apically; dististylus long, thin, with short apical hook; neck of epiphallus extremely long, thin, tapering sharply to tip of aedeagus; epiphallus with prominent bulb-like process dorsally; epandrium subquadrate, with prominent, darkly sclerotized posterior process.

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Female. Similar to male except frons and vertex grey to black, wing hyaline throughout, abdominal tergites pale yellow pilose with definite crossbands of black hair and white to pale yellow tomentum.

*Genotype, Bombylius montanus* Johnson and Johnson.

Species of *Bombylius* (*Zephyrectes*) are closest in appearance to the Palearctic *B. cruciatus* Fabricius and its relatives, and can be separated from these and other species of *Bombylius* sensu stricto by the tan to yellowish face, frons, and genae, the white scales on the second and sometimes third segments of the antennae, the predominant white pile on all parts of the body, being most dense on abdominal segments IV-VII of the male, the prominent posterior process of the epandrium, the conspicuous bulb-like process on the dorsal edge of the epiphallus, and the long neck of the epiphallus leading to the tip of the aedeagus.

In addition to the above characters, dissections of *anthophoroides* and *montanus* show yet another shared character which strongly suggests possible generic status for these species. Cross-sectioning of the thorax reveals the number of muscle bundles in the dorsal longitudinal flight muscle to be from 10-12 in both *anthophoroides* and *montanus*. When cross-sectioning numerous other species of *Bombylius*, it is found that the number of muscle bundles range only from 4-5. Tiegs (1955) implies that the increasing number of muscle bundles correspond to the increasing strength of flight of that insect. My studies confirm this and also show that the number of muscle bundles appears to be fairly consistent within species of a genus (e.g., *Mythicomylia* - 3; *Anthrax* - 7-8; *Poecilanthrax* - 5-6). Because of this latter fact, and noting that species of *Zephyrectes* consistently have more than twice the number of muscle bundles than species of *Bombylius* sensu stricto strongly suggests that *Zephyrectes* could be separate genus. I hesitate to raise *Zephyrectes* to generic status, though, until more studies are done on species of *Bombylius* from other zoogeographical areas and compared with *Zephyrectes* so as to clarify its position within the subfamily Bombyliinae and its relation to *Bombylius* sensu stricto.

### *Bombylius (Zephyrectes) anthophoroides* Evenhuis

*Bombylius anthophoroides* Evenhuis, 1977: 124.

Material of this species was examined from Riverside, San Luis Obispo, and Ventura Counties, California. Cross-sectioning of the thorax show the number of muscle bundles in the dorsal longitudinal flight muscle to be 11-12.

### *Bombylius (Zephyrectes) montanus* Johnson and Johnson

*Bombylius montanus* Johnson and Johnson, 1975: 413.

The original description records specimens of this species from Idaho and Utah. Since then, specimens of this species have been collected from the following counties in California: Kern, Lassen, Los Angeles, Orange, and Riverside. Cross-sectioning of the thorax show the number of muscle bundles of the dorsal longitudinal flight muscle to be 10-12.

### *Bombylius curtirhynchus*, n. sp.

Male. Length 6mm. Frons black, and gula light brown; face and oral margin pale

yellow to white pilose; gena silver recumbent tomentose above and lateral to antennal bases; face, oral margin, gena with black hair; gula white pilose; ocellar tubercle black with black hair; occiput cretaceous, white pilose, pale yellow pile laterally as continuation of pleural stripe of thorax; antennae black, segments I and II with black hair, segment III bare; style with segment I black, segment II brown. Scutum and scutellum dull black, pale yellow to white pilose on scutum; tufts of black hair anteriorly on scutum behind occiput and laterally above wings; short black hair intermixed with pale yellow pile on notal disc; pleura grey-black, pale yellow pilose; pleural stripe with black hair; scutellum with intermixed pale yellow and white recumbent pile, long black hair on posterior margin; halter stem brown, knob yellow. Legs brown; coxae and femora white pilose basally, femora with white scales; claws black. Wing (Fig. 3) infuscated brown basally, extending to end of  $R_2+3$ ; basal halves of anal and axillary cells infuscated; spots present on anterior and posterior crossveins, base of  $R_4$ , junction of  $M_1$  and  $R_5$ , and bases of first and second posterior cells; squama brown, fringe yellow. Abdomen black, pale yellow pilose; lateral tufts of black hair on tergites II-IV, white hair laterally on tergites V-VII; black hair on posterior margins of tergites II-VII; middorsal stripe of white tomentum on tergites II-VII; sternites brown, white pilose on posterior margins of sternites. Genitalia (Fig. 2) with basistylus linear-ovate; dististylus short, tapering sharply toward apex; aedeagus with rounded beak-like process; epiphallus with long tapering neck; epandrium rhomboid with weak posterior process; anterior process moderately pronounced.

**Female.** Similar to male except frons and vertex light brown, vertex with sparse golden tomentum and black hair; oral margin with mixed black and white pile, sparser than in males; thorax with reduced middorsal stripe; golden tomentose on scutum.

**Holotype male and allotype female** from Devore, San Bernardino Co., Calif., III-30-75 (N. Evenhuis), both in California Academy of Sciences.

**Paratypes.** California. Los Angeles Co.: 1♂, Cal Poly Pomona Campus, III-20-73 (N. Evenhuis). Riverside Co.: 3♀, Univ. Calif. Riverside Campus, in hills, IV-3-75 (N. Evenhuis); 1♂, Hwy. 74, 11.5 mi. S. Palm Desert, Deep Cyn., III-21-75 (N. Evenhuis). San Benito Co.: 2♀, Pinnacles Nat. Mon., III-27-64 (W. Turner). San Bernardino Co.: 12♂♀, Devore, III-24-75, III-30-75, IV-3-75, IV-12-75 (N. Evenhuis). Shasta Co.: 1♀, Redding, IV-5-66 (B.A. Freeman).

Numerous specimens were examined from the following counties in California: Calaveras, Kern, Lake, Los Angeles, Monterey, Napa, Riverside, San Benito, San Bernardino, Shasta, Solano, Sonoma, Tulare.

This species is separated from its congeners by its short proboscis (less than 3mm), the spotting and infuscation of the wing, the prominent middorsal stripe of the abdomen extending onto the thorax, and the genitalic characters.

### *Bombylius painteri*, n. sp.

**Female.** Length 10mm. Head black; frons white tomentose above and lateral to antennal bases; vertex short recumbent golden pilose; face black pilose; oral margin white pilose, antennae black, segment I mixed black and white pilose, segments II and III bare; stylar segments brown; occiput pale yellow pilose; gula grey, white pilose. Scutum and scutellum black, pale yellow to yellow pilose, sparse black hair intermixed on scutum; tuft of black hair middorsally on anterior portion of mesoscutum; pleura black,

yellow pilose above, white pilose below; pleural stripe of thorax with a few black hairs; scutellum with long black hair on posterior margin; halter stem orange, knob brown. Coxae black, intermixed white and black pilose; femora black basally, orange-yellow apically, with white scales, fine black hair ventrally; tibiae and tarsi orange with white scales. Wing (Fig. 4) infuscated light brown at extreme base; spots present on anterior and posterior crossveins; squama brown, pale yellow fringe. Abdominal tergites black, pale yellow pile overlying shorter recumbent pale yellow hair; sparse black hair on posterior margins; sternites brown, white pilose.

**Male.** Unknown.

**Holotype female** and **paratype female** from 30mi. NW Laredo, Webb Co., Texas, III-4-72 (M.W. McFadden), both at Washington State University.

This species is closest in appearance to *Bombylius duncani* Painter and can be separated from it by the tuft of black hair anteriorly on the mesoscutum, the light infuscation of the wing and the absence of strong black tufts of hair laterally on the abdominal tergites.

*Bombylius albicapillus washingtoniensis*, n. ssp.

**Female.** Length 12mm. Frons and vertex brown; frons white pilose, a few erect black hairs along eye margin; vertex with sparse short black pile; face grey-black, black pilose, yellow recumbent pile lateral to antennal bases; occiput and gula grey; occiput dense pale yellow pilose; gula with white hair; oral margin brown, white pilose; antennae grey-black, segments I and II with pile as long as segment I, segment III bare; stylar segments brown. Scutum and scutellum black, pale yellow pilose with longer pale yellow pile on posterior margin of scutellum; pleura grey above, tan-grey below, pale yellow pilose; pleural stripe of thorax with few black hairs restricted to pteropleuron, otherwise dense yellow pilose; middorsal stripe of short white tomentum anterior to scutellum; halter stem orange, knob yellow. Coxae and base of femora grey-black; white pilose on coxa and basally on femora; femora orange-yellow with white scales; tibiae and tarsi orange yellow. Wing (Fig. 5) infuscated brown basally, extending almost to end of  $R_2+3$  and r-m crossvein; axillary cell infuscated; spots present on anterior and posterior crossveins, distal end of discal cell, base of second posterior cell, distal end of  $R_2+3$ , base of  $R_4$ , and apex of first posterior cell; squama brown, fringe pale yellow. Abdominal tergites dull black, dense yellow pilose with sparse black hairs on posterior margin of tergites II-VII; sternites brown, white pilose.

**Male.** Unknown.

**Holotype female** from Pullman, Washington, V-23-69 (R.W. Dawson), at Washington State University.

**Paratypes.** Washington. 1♀, topotypic, collected with the type; 1♀, 10mi. W. Chenalis, VII-61 (C.A. Johansen).

This subspecies can be separated from the nominate subspecies by the white pile of the oral margin, the lack of dense tufts of black hair laterally on abdominal tergites II-IV, and the generally lighter pile of the thorax and abdomen.

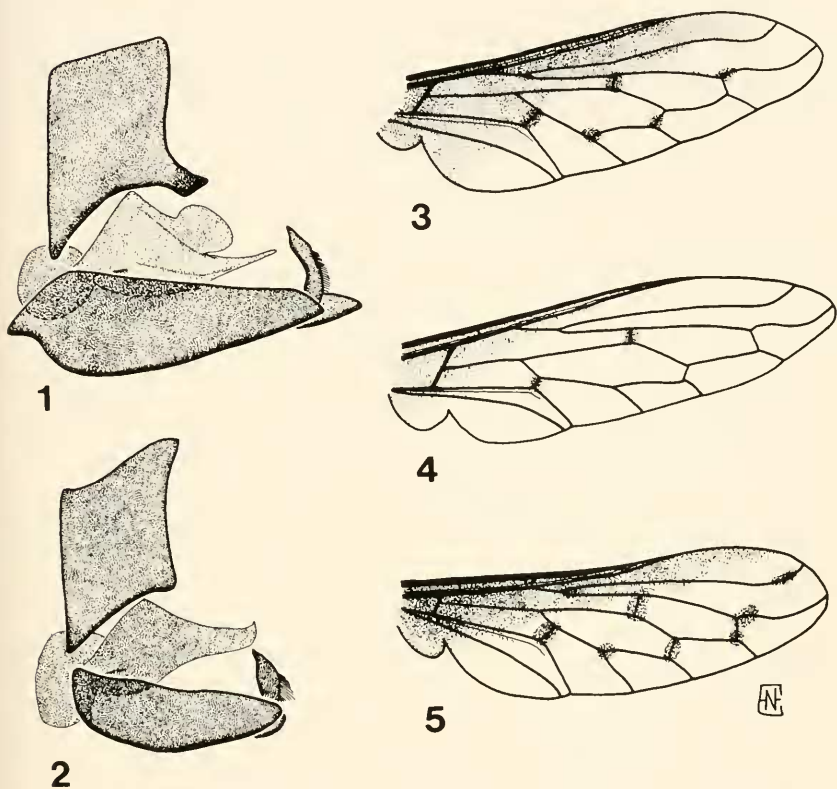


Fig. 1. *Bombylius (Zephyrectes) anthophoroides*; male genitalia, lateral view.

Figs. 2-3. *Bombylius curtirhynchus*, new species. Fig. 2. Male genitalia, lateral view.  
Fig. 3. Right wing of male paratype.

Fig. 4. *Bombylius painteri*, new species; right wing of female holotype.

Fig. 5. *Bombylius albicapillus washingtoniensis*, new subspecies; right wing of female holotype.



*Bombylius lancifer xanthothrix*, n. ssp.

**Male.** Length 10-12mm. Frons brown, rest of head black; black pile on frons, face, genae, vertex, oral margin, and ocellar tubercle; occiput with yellow pile; gula grey-black, white pilose; antennae black, black hair on segments I and II, segment III and stylar segments bare. Thorax black, dense yellow pilose throughout; pleural stripe absent; halter yellow. Coxae grey, yellow pilose; femora orange, black ventrally, white pilose; tibiae and tarsi orange to brown. Wing infuscated light brown basally, extending to r-m crossvein; rest of wing hyaline; squama brown, fringe yellow. Abdomen black; tergites yellow pilose, sparse black hairs present on posterior margins; sternites white pilose on all segments. Genitalia not dissected.

**Female.** Hardly distinguishable from male except for dichoptism and sparse golden hairs mixed with black hairs on frons.

**Holotype** male and **allotype** female from Fields' Spr. St. Park., Asotin Co., Wash., VI-6-7-71 (M. Wiebers, D.N. Ferro), both at Washington State University.

**Paratype** male from 6mi. N. Moscow, Latah Co., Idaho, IV-21-71 (M. Mehary).

Specimens of *xanthothrix* can easily be separated from the nominate subspecies and its congeners by the striking yellow pile of the body and the absence of black crossbands on the abdominal tergites that are so conspicuous in *lancifer lancifer*.

#### REFERENCES

- Evenhuis, N.L. 1977. New North American Bombyliidae (Diptera) with notes on some described species. *Ent. News* 88(5/6): 121-126.
- Johnson, D.E., and Johnson, L.W. 1975. Notes on the genus *Bombylius* Linnaeus in Utah, with key and descriptions of new species (Diptera: Bombyliidae). *Gr. Basin Nat.* 35(4): 407-418.
- Tiegs, O.W. 1955. The flight muscles of insects — their anatomy and histology; with some observations on the structure of striated muscle in general. *Philos. Trans. Lond. (B)* 238(65): 221-348.

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A paper explaining the major changes proposed by the Commission's Editorial Committee to the existing Code has been published in the *Bulletin of Zoological Nomenclature*, vol. 34, part 3. Copies may be obtained (price 50p) from the same address as copies of the draft Code.